

DESERT

PLANT LIFE

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GARDENS

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COMPARATIVE MORPHOLOGY OF
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CERTAIN OF THE OPUNTIEAE

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READING AND REFERENCE

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FOURTH QUARTER





Dr. Helia Bravo

GEORGE LINDSAY
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DR. HELIA BRAVO HOLLIS

The gracious and charming lady in the accompanying photograph is Dr. Helia Bravo Hollis, who is an outstanding Mexican botanist and specialist in the study of cacti.

Dr. Bravo became associated with the Biological Institute of the University of Mexico in 1929, and for several years was actively engaged in field and research work which resulted in the publication in 1937 of her comprehensive study of the Mexican cacti, a seven hundred page book, *Las Cactaceas de Mexico*. After finishing this work Dr. Bravo retired from professional to private life, and only recently has she resumed her position with the Biological Institute.

At the present time Dr. Bravo is completing an ecological study of the tropical forest region of southern Mexico. She intends to continue her work with cacti, for as she points out, the knowledge about Mexican cacti is not a static thing. New regions are becoming accessible for plant exploration as a result of the government's road building program, and new plants are being discovered and old concepts change as new information becomes available. Dr. Bravo is already accumulating information for a new edition of her book.

Another event of importance is the formation of a cactus section of the Mexican Botanical Society. The active group of cactus enthusiasts, under Dr. Bravo's direction, are exploring new regions and accumulating plants for a new botanical garden which will be devoted to Mexican xerophytes. The work of this group will be a very important asset to cactus students all over the world.

SAN BENITO ISLANDS

Near the middle of the peninsula of Baja California, a great hook extends westward, ending in Punta San Eugenio and forming the southern shore of Sebastian Viscaïno Bay. North and west of the point is a small group of islands which, to judge by the conformation of the ocean bottom, may once have been part of this hook. West of the point lies Natividad Island, and north of that, Cedros Island, the largest of the group. The San Benito Islands lie about 17 miles west of Cedros Island and about 40 miles northwest of Punta San Eugenio.

Approaching the San Benitos from Guadalupe Island to the west we landed first on the westernmost and largest of the three small islands. This island is about 2 miles long and three stories high: from a low plain at the east end there abruptly rises a mesa about 400 feet high capped by a rounded hill with a total height of over 600 feet. The eastern island is likewise hilly; but the middle island is low and flat, being a continuation of the low plain of the western island and separated from it only by a narrow and shallow channel.

On the mesa of the western island stands a lighthouse. At the time of our visit, the keeper, Señor Morett, was all alone, his assistant having gone to Cedros Island to have some teeth extracted. Señor Morett seemed very glad to have visitors, and he obligingly showed us over his small domain and put out traps to provide us with lobsters.

The vegetation of the San Benitos is rather sparse and lacking in variety, and at the time of our visit it looked very dry and unhappy. Its appearance is not particularly improved by the wild goats or by the two or three burros belonging to the lighthouse service. When we asked Señor Morett whether this had been a particularly dry year, he said that would be impossible since it practically never rained anyhow. The most common plant is *Frankenia Palmeri*, a drab shrub about a foot high. Also common are *Agave Sebastianana*, *Mammillaria neopalmeri*, an unidentified *Opuntia*, and the low shrubby *Euphorbia misera*.

When the U.S.S. *Ranger* was surveying the shores and islands of Baja California in 1888 and 1889, Lt. Charles Pond made the first extensive botanical collection from the San Benito Islands. Though he said that vegetation was abundant, he found but 24 species of flowering plants; and only 16 species have since been added to the list. Four species appear to be endemic; most of the others occur also on nearby Cedros Island.

On offshore rocks near the landing we found *Lavatera venosa*, a shrubby mallow with handsome flowers of white striped with violet. This was first discovered on the San Benito Islands and is usually said to be endemic there, but it also occurs on San Gerónimo Island and on rocks near the mouth of San Bartolomé Bay. Dr. Edward Palmer, who landed on West San Benito



COLONY OF *LOPHOCEREUS SCHOTTII*
ON EAST SAN BENITO.



CRESTED BRANCH OF *LOPHOCEREUS SCHOTTII*
ON EAST SAN BENITO.



Señor Morett Baiting his lobster traps.

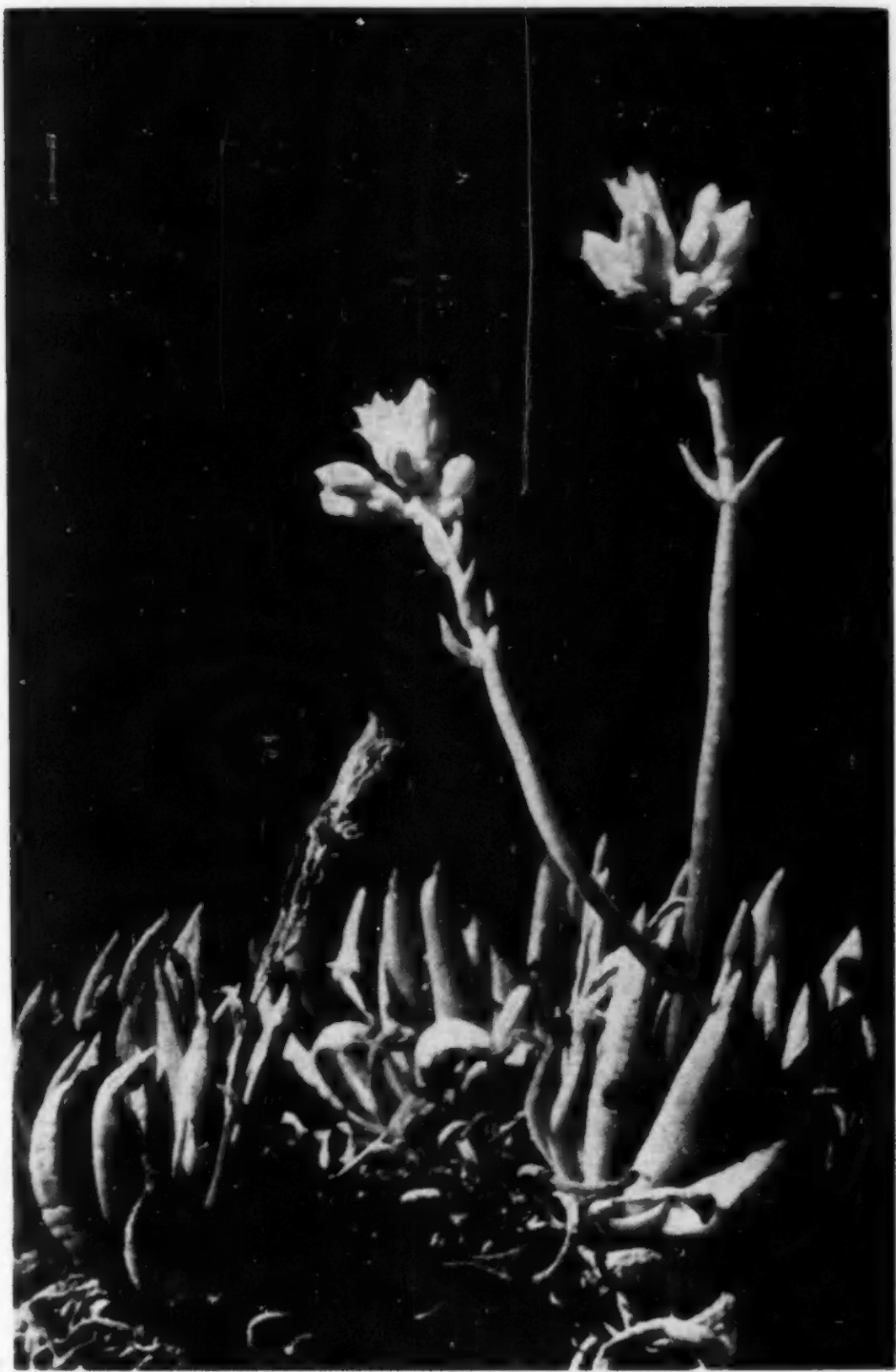
Island in 1889, called this the commonest plant, "its bright green [giving] the island rather a fertile look." But at the time of our visit, it was scarcely to be found on the main island; like its cousin of the Californian islands, it seems to be a favorite of browsing animals and hence is now nearly confined to the rocks offshore. A third species of *Lavatera* occurs on Guadalupe Island and the Coronado Islands; and the fourth west American species is known only from Outer Islet, south of Guadalupe Island.

Brandegge reported *Opuntia prolifera* and *O. tessellata* from the San Benito Islands. The *Opuntia* of the west island resembles *O. prolifera* but has a different habit; apparently it has not been collected in flower or fruit. By *O. tessellata* (= *O. ramosissima*) Brandegge probably meant the plant that we saw on the east island; this also seems not to have been collected in flower or fruit. Dr. Rose collected both species in 1911 and described them in "The Cactaceae" merely as *Opuntia* species, without specific names.

Mammillaria neopalmeri is an attractive plant with clustered heads covered by white spines. A few plants bore yellowish flowers or red fruits. This species has been found only on the San Benito Islands, but in some places there it is very abundant. For an account of this plant see DESERT PLANT LIFE 22:41-44, 1950.

Señor Morett, a keen observer who knew every inch of his island, pointed out a lone bisnaga, *Ferocactus chrysacanthus*, which he said was the only one he had seen. This is the species common on Cedros Island and not previously reported from the San Benito Islands. It was a small specimen, and he remarked that when he came back to the island after several years' absence he had been unable to see any difference in its size.

In many places the steep slopes are densely covered with *Agave Sebastiani*. Its globular rosettes are very similar in appearance to those of *A. Shawii* of the northern coast of Baja California, but the leaves are usually glaucous. The stocky floral stems, about 6 feet tall, bear compact clusters of large yellow flowers that stand erect and are filled with sticky nectar. We saw only two or three in flower, though many floral stems stood from previous years.



DUDLEYA LINEARIS (GREENE) BRITTON & ROSE.
WEST SAN BENITO ISLAND (2951), APRIL 18, 1948.



REID MORAN EXAMINES A FLOWERING SPECIMEN
OF AGAVE SEBASTIANA, WEST BENITO ISLAND,
APRIL 19, 1948.

Dr. Palmer reported two species of *Agave* on the San Benito Islands but he collected neither. In 1911 Dr. Rose looked for two species but noted only *A. Sebastiania*. A small specimen that Rose collected without flowers or fruit, Trelease took to be the second species; he thought it related to *A. deserti* and named it *A. disjuncta* because it grew so far from its supposed relatives. All plants that we saw seemed to be of the single species, *A. Sebastiania*. For, although there is great variation in size and shape of leaves and in number of leaves per rosette, and although the extremes are quite different, there are all intermediates and all combinations rather than a separation into two distinct kinds. Furthermore, all plants have the same kind of inflorescence, and the leaves of all have horny margins. Some of the younger plants with narrow leaves do recall *A. deserti*: perhaps it was one of these that Trelease described. On such a small and barren island it would be difficult to overlook a second species of *Agave*.

The status of *Agave Sebastiania* is somewhat uncertain: it is very closely related to *A. Shawii*, of which Gentry considered it a variety. The plants named by Trelease as *A. Orcuttii*, *A. Goldmaniana*, and *A. pachyacantha* are also closely related. At the time of Trelease's monograph, few collections were available; and he recognized nearly half as many species as there were collections. His map gives an exaggerated impression of discontinuous

distribution. We have collected and observed all these species at or near their type localities and elsewhere. Usually at each locality there is great variation in leaf shape and armament, and many of the alleged differences do not hold. It is true that there are some differences, most notably in size; but in view of the intergradation that apparently exists, some of these species seem rather weak.

The San Benito Islands are the only known locality for *Dudleya linearis*. It has also been reported from Cedros Island, but apparently in error. We found only a few living plants of the *Dudleya* on the western island, but many dead caudices showed that it had been quite common until recently. Apparently the burros, belonging to the lighthouse service, and goats are rapidly exterminating the *Dudleya*.

On the San Benito Islands we again found the common iceplant, *Mesembryanthemum crystallinum* and, in smaller quantities, the slender-leaved iceplant, *M. nodiflorum*.

After two days at the western island, we moved to East San Benito, anchoring in a snug little cove on the east side. Large areas of sea-bird rookeries are practically barren of plant life, but the rest of this island is much like the western island. Here we found the second species of *Opuntia*, also unidentified. On the western slope is a large colony of *Lophocereus Schottii*. One plant was crested, which is extremely rare in this species. Although apparently the island had no herbivorous inhabitants at the time of our visit, it seemed to be devoid of *Dudleyas*.



GEORGE LINDSAY (RIGHT) AND FRIEND.

CURT BACKEBERG
Jardin Botanique Les Cedres
St. Jean Cap Ferrat A.-M.

A Report from the Marnier Gardens

Thank you for your letter asking me for a report from my new location. Well, some people call it "Little Africa", others "Little Florida"; I prefer the latter name for this paradisiac corner of the Old World, a favourite place also for many of your countrymen. We have just had a visit by two American cruisers with an admiral, and on the blue sea the rapid motor-boats with water-skating boys remind me of the Hawaiian wave-riders of Waikiki.

But that's outer landscape only; most of the visitors don't know our inner paradise in Les Cedres, what I call "Little Florida" and I recall the many Kodachromes I got some time ago from a friend in Fort Myers: Palms, Bamboos, flowering Victorias, trees with many Bromeliads and other epiphytes, the darkness of tropical forests with their tree-ferns, maturing bananas, climbing lianas and beautiful flowering orchids. A little selection only of what is to be seen here.

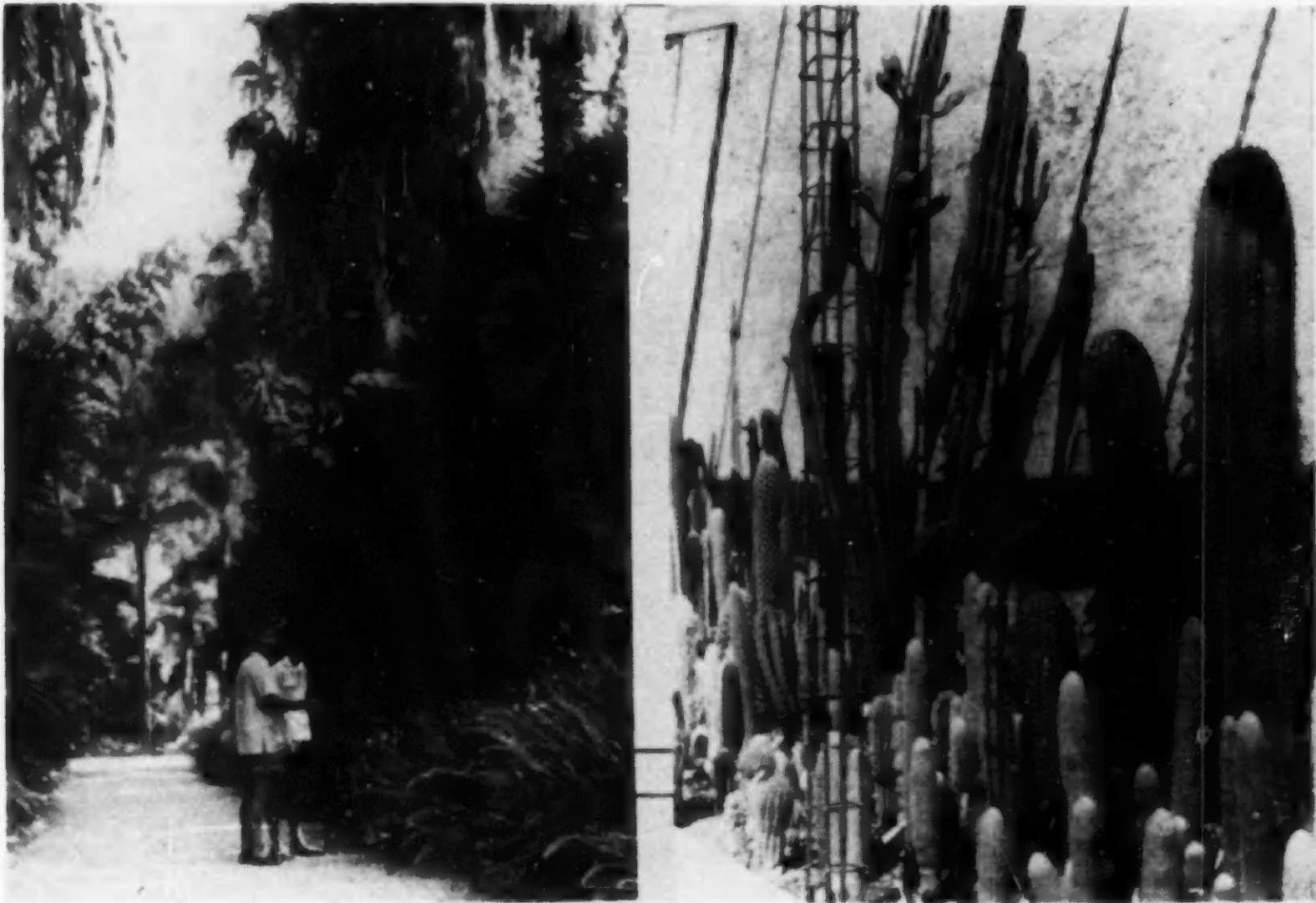
Do you want some figures? We have a collection of about 60 different palms, about 10 species of the rare *Chamaedorea*, of the tree-ferns about eight species. Wonderful Araucarias you will see here, about six species. Of *Acacia* we have about 35 species, and I hope some day will be found here an "Opuntiarium" in that elder part of the park where about 200 Olive-trees are giving a rich crop every year. Here the *Olea europea* reaches the strongest growth of all European olive-plantations.

No approximate figures can be given of all important living material here; there are many thousands of plants and hundreds of trees, for this is also one of the most outstanding tropical Arboretums I know of in Europe, if not the only true tropical Arboretum of the Old World. So you find here more than 30 species and forms of *Citrus*, and even the grapefruit matures here. This, perhaps, gives you the best idea of what are the possibilities given by nature to this mild cape "Cap Ferrat".

Special collections are considerable also; for instance we have about 250 Bromelias or more, and many of them are just in flower.

Of course it is of special importance for us what can be said about cacti and other succulents. But it is nearly impossible—you will realize it—after a month and a half to give an exact idea of the whole material which is found here of these plants. There are considerable collections of Aloes, Agaves, Gasterias and many of the smaller genera such as *Anacampseros*, of which all rarest species are found here (many *Anac. alstonii* flowered in these days with their beautiful, great white flowers). Of special interest are the Mesembrianthemaceae which are represented in all genera by a great number of species, and very often arrive new plants from South Africa. An object of special interest for the visitors is the perfect mimicry-show of *Lithops*, *Titanopsis*, *Stomatium*, etc.; the surrounding mountains with their many colored rocks have delivered the material for the astonishing mimetic arrangement of the plants.

I forgot to mention the Euphorbias of which many species are found here, even the biggest representatives of this family, up to five meters high;



One of the many tropical promenades.

A new concrete pillar in construction for the winter protection by Vitrex windows by which the frames are covered for some months.

amongst them, of special value, the rarer species from Madagascar (where also are found other rare representatives, as for instance the curious *Didiera mirabilis*).

Last but not least the cacti, my special friends. Perhaps a photograph can give a better impression than my words. In comparison to the Exotic Gardens of Monaco here has been created a special botanical show, perhaps not so impressive to visitors who do not know much about cacti, but for the connoisseur a wonderful collection of the most beautiful and rarest species. Dozens of white Espostoas you will find here. Of the *Cereus maculatus* that was recently identified by Cutak to be a *Peniocereus* several large plants are just in full flower. Some day I will have to finish my "notes on cacti" which I have collected during the past years; then I have here the best additional material I can find. And the other additional material of cacti are . . . my own plants.

I have made in my lifetime two great experiments with cacti. The first was, to bring a collection of giant forms from Mexico to Hamburg, in 1939, globular cacti up to one ton, and *Cephaloc. senilis* as well as old "Hoppenstedtii" up to seven meters high. They arrived well, rooted well and many of them flowered in Hamburg, until the war set an heroic end to these heroic plants.

The second great experiment is just over now: in the middle of the summer, in the middle of the growing period, I had to transplant several thousands of my plants, just into the warmest corner of Europe, in a wagon where temperature was rather high.

• It will be of interest to learn that also this experiment had the expected result: nearly no plants lost, nearly all with new roots again, many already flowering again, fruits are maturing . . . the three-weeks'-trip and the interruption of the summer-growth seems to have been without any influence on the plants. Such are cacti!!!

Now we have here "all things together" to begin with another project: to collect important data and observations which are possible here better than in other European collections, confined to greenhouses. Some day you will hear from me more about that.

I think you will be satisfied with this short report, and I hope it may give you a little impression of this location, created by Mr. Marnier-Lapostolle. He could have given you a still better report, for he knows more about his plants than I could see within this short time. It will be a hard struggle for me to compete with him in knowing all the material as he knows it; but I believe surely that we both will do some useful work in the future, for a still better knowledge of many plants, especially of the succulents. Mr. Marnier's enthusiasm will facilitate it, and one thing is sure: in the traditions of French research work on the succulent-sector and of the great French patrons of this line of our studies, as was for instance Monville, the name Marnier will probably be the most important in later days.

A good omen, I hope so, for the work that is waiting for me here, is that now the new edition of "Stachlige Wildnis" is ready; I just received the first copy from the editor. The cactus-friends will see a very nice edition. It reports of the time of my travels. Now follows the period of a careful additional work: to strike the definitive balance of those travels and to collect carefully all notes and observations which have been made and will be made still, for a better knowledge of succulent plants, the great work we all serve in our sphere.

Comparative Morphology of the Foliar Appendages in Certain of the Opuntieae

In addition to *Opuntia teres* and *O. leptocaulis*, described above, similar studies were made of the following:

Opuntia prolifera

O. ramosissima

O. vilis

O. Moelleri

Tephrocactus sp.

Tephrocactus glomeratus

Quiabentia chacoensis (Partial study only due to lack of material).

In general these forms corresponded with those already described, and the differences will be discussed in the summary and conclusions.

SUMMARY

In order to make the observations noted above more available for purposes of discussion, they are summarized below.

The stem apex. In all of the forms studied except the *Tephrocacti* the stem apex was uniform in structure.

The tunica was always uniseriate (there was a tendency toward a biseriate tunica noted in *O. Moelleri*). The cells of the tunica were flattened in the periclinal plane and were uninucleate.

The corpus was always made up of the same three zones: the initial zone, which was composed of a clump of thick-walled, somewhat vacuolate meristematic cells, with division planes in all directions; the generative zone, composed of thinner-walled, less vacuolate, and more or less stratified embryonic cells around the periphery of the corpus; and the central rib meristem, in which vertical stratification, increased size, and vacuolation are the predominant features. In *Opuntia vilis* the vertical alignment of the cells in the rib meristem soon becomes distorted as periclinal divisions occur during the maturation of the pith.

In the *Tephrocacti* the stem apices are very different. Undoubtedly this is at least partially due to the fact that the apical meristem is at the base of a cavity rather than on the summit of a mound of tissue. This fact was not only noted in the two species which were described in detail but also in two other species which have not hitherto been mentioned. At any rate, zonation in the corpus of the *Tephrocacti* is practically lacking. In the unnamed species of *Tephrocactus* the corpus could be divided into two zones, an initial zone composed of somewhat vacuolate meristematic cells with their long axes in the anticlinal plane, and a secondary zone composed of somewhat larger and more vacuolate meristematic cells. The initial zone participates in the formation of the leaf primordia, the cortex and the vascular cylinder. The secondary zone forms the pith. Both are block meristems. This arrangement of the apical tissues is carried even farther in the case of *O. glomerata*. The meristem is confined to the walls of a V-shaped notch with little or no zonation.

The axillary meristem. In every case examined the axillary meristem

develops from the flank of the apical meristem, becoming isolated from the latter by the maturation of some of the intervening cells. Consequently the axillary meristem is composed of cells from the tunica and the outer cell layers of the corpus. In the early stages of its development the axillary meristem produces spiny structures from the abaxial side only. In every case, however, the meristem became symmetric and produced primordia on all sides in a centripetal succession after a few of these asymmetric structures had been initiated.

The leaf. Leaf primordia develop as small mounds of embryonic cells on the sides of the stem apex. They are derived from the tunica and the first few cell layers of the corpus. The leaf primordia reach a considerable size before maturation of the cells begins. In the forms studied there is no great meristematic activity in the leaves after the cells start to mature, and after that time growth of the leaf is mainly accomplished by an increase in cell size rather than cell number.

The leaves of the North American species of *Cylindropuntia* differ from those of the South American species in the larger size and greater abundance of the mucilage cells as well as the more disorderly and less compact arrangement of the cells in the mesophyll.

The spine. In all cases spines are initiated from the axillary meristem in the same way that leaves are initiated from the apical meristem. The spine primordia begin differentiation very early and continue growing in length by means of a basal intercalary meristem at the same time the apical cells are undergoing a basipetal maturation. Vascular bundles were found running to the base of the spine in all species studied, but they were never seen to enter the spine itself.

The glochid. The development of the glochid is identical with that of the spine. No feature sharply delimiting glochids from spines was discovered in this study. The spines of the North American *Cylindropuntias* have sheaths, but the sheaths are epidermal structures and have no bearing on the ontogeny of the glochids and spines themselves. Vascular strands run to the bases of the large glochids and in one case actually entered the base of the glochid.

The spine sheath. The spine sheath is a structure derived from the epidermal cells immediately surrounding the base of the spine. The cells of the sheath are arranged in vertical files, and the sheath may be uniseriate or several cells thick. Growth in length is accomplished by means of the intercalary growth region at the base of the sheath. The mature cells of the sheath are highly vacuolate and eventually die, leaving only the cell wall behind. Very old sheath cells collapse, and the sheath becomes very dry and membranous.

The trichomes. The development of the trichomes is practically identical with that of the sheath. They are produced from the epidermis and grow in length from an intercalary growth region at the base of each hair. The appearance of the cells at various stages in their lives is very similar to sheath cells of comparable age. However, mature cells in the trichome are generally somewhat broader than those of the sheath and their walls are generally pitted or otherwise sculptured. Sculpturing on the walls of the sheath cells is minute and inconspicuous, if present at all.

Multinucleate cells. Several of the species investigated have multinucleate cells in the actively growing portions of the plant. Binucleate cells were noted in various portions of the stem apex, in the intercalary growing region

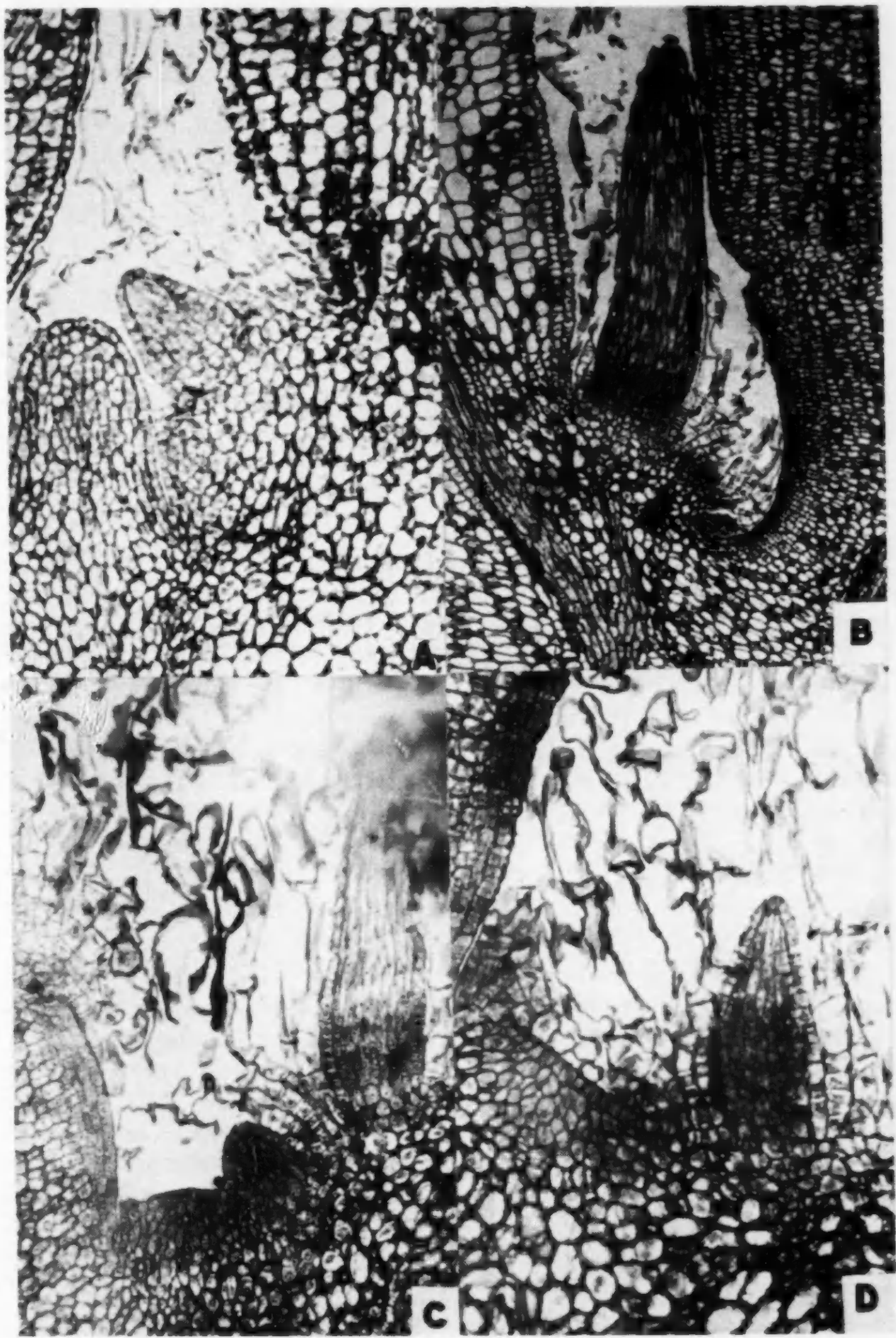


PLATE 10

at the base of the spine and in young leaf primordia. In all of these places the cells were in the embryonic condition, and small, and in some of the cases a skeptic could raise some doubt as to the existence of two nuclei within the confines of a single cell wall. However, in *Quiabentia chacoensis*, a species from another genus in the *Opuntieae*, binucleate cells were found in which there can be no slightest question that two nuclei exist.

IRA W. CLOKEY. *Flora of the Charleston Mountains, Clark County, Nevada*. University of California Publications in Botany **24**:1-274. November, 1951. Paper, \$2.75; cloth, \$3.75.

Mr. Clokey, a mining engineer, was interested in botany from childhood. Beginning in 1935, he spent several seasons collecting plants in the Charleston Mountains, in southern Nevada. He worked up the material with help from several specialists, publishing several preliminary papers. The manuscript for the flora was accepted for publication just before Mr. Clokey's death in January, 1950.

The flora includes 699 species and subspecific taxa. Thirty-one are endemic to the area and an additional 17 to the county, and only 48 are introduced. Mr. Clokey estimates that the list is at least 80 percent complete.

The flora lists *Agave nevadensis* and three species of *Yucca*. The only Crassulaceae is *Echeveria pulverulenta* subsp. *arizonica*, sometimes known as *Dudleya*. In the Cactaceae (previously treated in Madroño **7**:67-76, 1943.) he recognizes seven genera and 18 species, of which he described three as endemic.

The introduction briefly but adequately covers the area's botanical history, geology (by C. R. Longwell), physiography, climate, edaphic areas, major plant associations, and endemism. A hachured map shows the main named localities, and insets show the position of the Charleston Mountains in the county and of the county in the state. There are keys to families, genera, and species; brief descriptions of genera; and, for each species, synonymy, statements of the type locality, of the occurrence in the area (with citation of specimens), and of the extralimital range, and various pertinent notes.

Clokey's flora apparently is the first local flora for the state of Nevada. It is a fine piece of work; and, in a state that has been poorly known botanically, it will be particularly useful.

Reid Moran

LEPTOCLADIA — BOTH CACTUS AND ALGA

Buxbaum's account of the tribe Euechinocactineae in the November 1951 issue of the *Cactus and Succulent Journal of America* includes some comments on the new genus *Leptocladia* F. Buxbaum which represents one of his three new segregates from *Mammillaria* Haw. *Leptocladia* F. Buxbaum, described in *Osterreichische Botanische Zeitschrift*, 1951, must be rejected as a later homonym of *Leptocladia* J. G. Agardh which is a small genus of marine Red Algae of the eastern Pacific. Agardh validly described his genus sixty years ago in his *Analecta Algologica* (*Actis Soc. Physiogr. Lundensis*, vol. 28, p. 95, 1892) with *L. binghamiae* of Santa Barbara, California as type.

In pointing out the necessary rejection of *Leptocladia* F. Buxbaum the writer offers no suggestion of another name to add to the already burdensome synonymy of *Mammillaria* Haw. Our past and present handling of this exceedingly plastic and apparently rapidly evolving group of plants is surely one of the more striking examples of the widespread inability and even inappetency of plant specialists to define or adequately to circumscribe either of the basic units of the system of nomenclature we use,—namely, the genus and the species. The resulting incompatibility of the interpretations of these basic units among different groups of organisms does small honor for modern systematics.

E. Y. Dawson

Frank W. Peirson 1865-1951

The amateur's value as an aid to science is well illustrated in the life of Frank W. Peirson.

The general public was hardly aware of his pursuits. He did little writing for publication, rarely gave addresses; had no taste for holding office. But to his door was worn the pathway, traveled by plant students—beginners and established botanists alike—who found discussions with him to their advantage.

A magnificent *Ficus macrophylla* Desf. (Moreton Bay Fig) with its huge protruding roots, marked the entrance to his home; it was the owner's special pride. All over the grounds were plantings, arranged in no formal design, growing unhampered by corrective treatment. The absence of cement driveways and walks carried out the appearance of a natural landscape and meandering about was a distinct pleasure to anyone not caring to see plants rounded up in little concentration camps of cobblestones and such like.

The family originally from Easingwold, Yorkshire, England, settled in Pennsylvania. Graduating from Haverford College where he specialized in comparative languages Mr. Peirson continued his studies particularly the languages of northern Europe, in Heidelberg, Germany.

His early education had little to do with formal botany. It was not till he moved to Altadena, California in his thirty-seventh year that he became seriously interested in plants. His classical background of Latin and Greek became a desirable asset in an age veering to chemistry and engineering; an asset students, beset by linguistic as well as botanical difficulties, considered most fortunate.

As a contemporary of Jepson (1867-1946), Mr. Peirson did considerable field work for him, collecting in the San Gabriel Mountains and high Sierras. In his "Acknowledgements", "Manual of the Flowering Plants of California" Jepson places Frank W. Peirson's name at the head of the list of those who contributed many thousands of notes and specimens. In his "Flora of California" the same author refers to his collection under Crassulaceae: *Echeveria densiflora* Berger (1)*; *E. lanceolata* Nutt. (2); *E. laxa* Lindl. (2); *Hasseanthus elongatus* Rose (1); *Sedum nivium* Dav. (3); *S. spathulifolium* Hook. (3); *Tilleae erecta* H. & A. (1).

For the "Manual of Southern California Botany" by Munz he prepared the section "Meanings of Specific Names."

Species which bear his name are found among the genera: *Allium*, *Astragalus*, *Linanthus*, *Lupinus*, *Penstemon* and *Potentilla*.

When advancing years made collecting too strenuous, he turned to succulents of which he had a choice collection.

Mr. Peirson's herbarium numbering some 13,000 specimens has been left to The Rancho Santa Ana Botanic Garden. When asked about the importance of the collection as compared with others of private ownership, Dr. Munz the director of the Garden stated that number of specimens was no indication of value. Rather in this instance it was the meticulous care

* Figures indicate number of references.

given the field notes; extra bits of observation beyond the requirements of the standard herbarium sheet that gave this collection particular significance.

The library remains with his sister Mabel B. a retired botany teacher of Pasadena City College. Many of the collecting trips were made together—a brother and sister team.

His endeavors live in the work of those whose labors he lightened.

CAROLINA SCHMOLL

Carolina Schmoll was not only alive to her commercial opportunities but she considered them as obligations to help clear the maze surrounding cactus plants, replacing it with some thing more like definite understanding.

She obtained by her own efforts, unknown species from their hiding places and sent them to European botanists along with her own helpful, detailed notes.

For quite some time to come, results of her discoveries will find their way into the literature of Mexican cacti.

The cactus minded all over the world, writes Mr. Krainz, lose in her one of the most energetic and best informed collectors; by her own diligence, through her discoveries she has erected a monument to cactus science."

C. W. ARMSTRONG

Another good friend who has left us was C. W. Armstrong, horticulturist of British Columbia, Vancouver, Canada.

His letters from the beginning were always cheerful, and helpful. It was his pride as a Canadian reader to have a complete set of DPL which he was bequeathing to an educational institution.

His photograph "shadow of the cross" cover design was one of the most beautiful ever sent in and remembered by everyone who ever saw it.

The Christmas Cactus, *Zygocactus truncatus*, is composed of many drooping fronds; from the tip of each frond springs a lovely flower, in color that of the *American Beauty* rose. It usually blooms at Christmas, hence its common name. It loves a sandy soil with leaf mold. When there is new growth coming, also when there are signs of bloom, it requires water, otherwise only enough is needed at a time to keep the soil from baking. These plants are also propagated from the leaf, the same as the Saintpaulia. They enjoy the same eastern window shelf when indoors. If desired, they may be set out in summer in semi-shade. They will be found to dry out more than when indoors, but always be careful not to rot the crown. Spray leaves with clear water once each week.

Newest Nevada Desert test of the atomic bomb "a searing, shining light, a horrendous ball of fire and a demoniacal, twisting zigzag cloud of deadly radioactivity," left the native yucca unscathed, judging by the photograph accompanying the description.

Horticulture January Cover features the Joshua Tree, *Yucca brevifolia*.

In the programs and speakers column in a late issue, *Golden Gardens*,

all California garden magazine, the name of Paul C. Hutchison appears. Subject, Succulent Plants. Fee upon consultation.

The Carl Purdy gardens of Ukiah, California, long a source of choice succulents, especially Sedums is to be closed, permanently.

In the near future is promised another edition of "Meine Kakteen" by Dr. Werdermann and H. Soenik. Prewar edition had 178 illustrations, 289 pages. RM 6.85.

Sukkulentenkunde IV is scheduled for early publication.

TYPOGRAPHICAL ERROR

The typographical error is a slippery thing and sly;
You can hunt till you are dizzy, but it somehow will get by.
Till the forms are off the presses, it is strange how still it keeps;
It shrinks down in a corner, and it never stirs or peeps.
That typographical error, too small for human eyes,
Till the ink is on the paper, when it grows to mountain size.
The boss, he stares with horror, then he grabs his hair and groans;
The copy reader drops his head upon his hands and moans.
The remainder of the issue may be clean as it should be—
But that typographical error is the only thing you see.

Statement of Ownership, Management, Circulation, Etc.

Required by Act of Congress of August 24, 1912.

OF DESERT PLANT LIFE, published monthly, except July and August, at Pasadena, California, for October 1, 1950.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Ellen M. Rooksby, who, having been duly sworn according to law, deposes and says that she is the Business Manager of the Desert Plant Life Magazine, and that the following is, to the best of his knowledge and belief a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher: Desert Magazine Publishing Company, Pasadena, California; Editor: Ellen M. Rooksby, Pasadena, California; Business Manager: Ellen M. Rooksby, Pasadena, California.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Desert Magazine Publishing Company, Pasadena, California; Ellen M. Rooksby, Pasadena, California.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also in cases where stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustee, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in said stock, bonds, or other securities than as so stated by him.

Ellen M. Rooksby, Business Manager.

Sworn to and subscribed before me this 29th day of September, 1951.

C. B. CREW, Notary Public.

(Seal)

(My commission expires November 16, 1951)

OCTOBER, 1951

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